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The **FERTILIZER** **SITUATION** for 1954-1955



**Commodity Stabilization Service
United States Department of Agriculture**

Washington, D.C.

September 1954

PREFACE

The Fertilizer Situation for 1954-55 is the twelfth in a series of reports on fertilizers issued by agencies within the U. S. Department of Agriculture.

This report has been prepared by J. N. Lowe, fertilizer staff specialist, Food and Materials Requirements Division of the Commodity Stabilization Service.

In the preparation of the report helpful assistance was given by the Bureau of the Census, Department of Commerce; Bureau of Mines, Department of the Interior; Chemical and Rubber Division, Business and Defense Services Administration; and the Fertilizer and Agricultural Lime Section, Soil and Water Conservation Research Branch, Agricultural Research Service, U. S. Department of Agriculture. This assistance is gratefully acknowledged.

The preliminary forecast of the 1954-55 fertilizer supply is again being combined with the usual midsummer tabulation, showing reported deliveries of the three primary plant nutrients during the previous fertilizer year.

It is intended that a supplemental report, reflecting any changes or developments, will be issued in the spring of 1955.

THE FERTILIZER SITUATION FOR 1954-55

The 1954-55 Fertilizer Outlook

In the aggregate, the available supply of the three primary plant nutrients--nitrogen (N), phosphoric oxide (P_2O_5), and potash (K_2O)--has reached a new high each year since 1938-39. During the first half of the year ended June 30, 1954, fertilizer movement within the trade was exceedingly slow. However, the year's total deliveries of plant nutrients to the trade in 1953-54 was 6.215 million tons compared with 5.957 million tons delivered the previous year. The increased supply in 1953-54 was absorbed by consuming channels with less apparent carryover than that for the previous year.

Prices during 1953-54 were irregular, averaging slightly below those prevailing during the previous year. Prices in 1954-55 are expected to be about the same as the 1953-54 levels or slightly below.

On the basis of information regarding domestic production and assuming an import-export balance at the 1953-54 level, it is estimated that the aggregate 1954-55 supply of the three primary plant nutrients will exceed the 1953-54 supply by about 5 percent.

Nitrogen (N):

It is currently estimated that the 1954-55 supply of nitrogen (N) available for fertilizer purposes will be approximately 2.2 million tons. This is a preliminary estimate based on current rate of production, plant capacity, storage facilities, and assuming an import-export balance at about the 1953-54 level. The estimated 2.2 million tons for 1954-55 would represent an increase of about 8.9 percent over the 2.02 million tons reported for 1953-54.

Details of the 1953-54 deliveries and the estimated 1954-55 supply of nitrogen by type and class are shown in tables 1 and 1 A.

The completion of three new urea production facilities with a combined annual capacity of about 260,000 tons of 45 percent material will tend to stabilize the proportion of solid to wet nitrogenous materials available in 1954-55. Based on trade deliveries, it is estimated that the supply of solid nitrogen materials (dry nitrogen) available for 1954-55 will comprise approximately 55 percent, and solution and liquid materials (wet nitrogen) about 45 percent of the total supply as compared with 57 percent and 43 percent, respectively, for the previous year.

Phosphates (P₂O₅):

The 1954-55 supply of available phosphoric oxide (P₂O₅) is forecast at 2.35 million tons, or about the 1953-54 level. This estimate is based on present production, trends in consumption in recent years, and an assumption that import-export relationships will be about the same as in 1953-54. The industry has the capacity to produce a considerably larger tonnage in 1954-55 if demand warrants.

Details of the 1953-54 deliveries and the estimated 1954-55 supply of available phosphoric oxide (P₂O₅) by type and class of material are shown in tables 2 and 2 A.

The 1953-54 deliveries of available phosphoric oxide (P₂O₅) was approximately 2.364 million tons, or 4 percent above the 1952-53 reported consumption of 2.271 million tons.

Potash (K₂O):

The 1954-55 supply of potash available for fertilizer in terms of potassium oxide (K₂O) is estimated at 1.97 million tons. This represents an increase of approximately 7.6 percent over the 1.831 million tons available in 1953-54. This forecast reflects the present rate of production, trends in use, and the probable demands in 1954-55 rather than the capacity of the industry to produce. Details of the 1953-54 deliveries and the 1954-55 forecast supply are shown in tables 3 and 3 A.

General

Fertilizer Plant Expansion Program:

In 1951, the U. S. Department of Agriculture inaugurated the program to expand fertilizer production facilities under provisions of the Defense Production Act of 1950, as amended.

The Department, in cooperation with the Land Grant Colleges and universities developed agriculture's 1954-55 estimated requirements for the three major plant nutrients: Nitrogen (N), 2,185,000 tons; phosphoric oxide (P₂O₅), 3,485,000 tons; and potash (K₂O), 2,185,000 tons. These requirements were taken into consideration by the Office of Defense Mobilization (formerly DPA) in the establishment of expansion goals.

At the request of Business and Defense Services Administration (formerly NPA), the Department in August 1953 projected agriculture's nitrogen requirements for 1956-57 to be 2,435,000 tons. The regional breakdown of the 1956-57 requirements with comparative 1952-53 consumption is shown in figure 1.

Status of Nitrogen Expansion:

The total expansion goal for domestic production of nitrogen for agricultural, industrial and other purposes was originally set at 2,930,000 tons for 1955. The Office of Defense Mobilization (ODM) amended this goal on February 5, 1954, by increasing the domestic production goal to 3,500,000 tons by January 1, 1957.

The capacity of the 18 synthetic ammonia plants in production on January 1, 1951, was determined to be 1,400,000 tons of contained nitrogen. Two plants constructed in 1950 and 1951 and the Morgantown ordnance works reactivated in 1952 were considered as a part of the expansion program; and are included in the 1951 and 1952 expansion as shown in the summary.

Summary

	<u>Capacity</u> <u>T/N/Yr.</u>
Total capacity 18 original plants as amended Feb. 15, 1954	<u>1,448,000</u>
1951 expansion	109,800
1952 expansion	227,000
1953 January to June expansion	8,900
1953-54 expansion	705,900
1954-55 scheduled completions	267,800
Under construction scheduled for completion July-Dec. 1955	92,000
Total expansion 1951 through 1955	<u>1,411,400</u>
Grand total capacity in place and under construction	
July 1, 1954	2,859,400
Covered by outstanding Certificates of Necessity, not	
under construction July 1, 1954	378,400
Available from byproducts and natural organic sources	265,000
Proposed total domestic capacity January 1, 1957	<u>3,502,800</u>

If the nitrogen expansion goal of 3.5 million tons of domestic productive capacity is to be attained, plant capacity equivalent to the outstanding Certificates of Necessity (378,400 T/N/Yr.) must not only be started but completed before January 1, 1957.

Assuming that the expansion goal is met and the import-export balance remains at about current levels, the nitrogen supply based on present trends in consumption should be ample to satisfy agricultural and other domestic needs through 1958.

Status of Phosphate Expansion:

The phosphate plant production capacity, P_2O_5 equivalent, at the time the expansion goal was established in 1952 was determined to be 2.25 million tons. In making this determination full consideration was

not given to the possibility of operation on a 2- or 3-shift basis. The base capacity figure more nearly represents production from plants in operation in 1951 than it does capacity to produce if conditions warranted 2- or 3-shift operations.

The phosphate expansion goal provided for an increase in capacity of 1.3 million tons of P₂O₅ equivalent over the 1951 production level.

The goal was not fully subscribed before it was closed in 1954.

Summary

	<u>Capacity</u> <u>T/P₂O₅/Yr.</u>
1951 base production (capacity)	2,250,000
1952-1955 expansion goal	1,300,000
1954-55 production goal	3,550,000
Total capacity subscribed under the goal	1,147,300
Normal superphosphate	166,600
Triple superphosphate	574,100
Ammonium phosphate	105,900
Nitrrophosphates	161,900
Other forms	138,800
Total capacity completed under the goal as of July 1, 1954	813,500
Normal superphosphate	162,700
Triple superphosphate	507,800
All other	143,000
Total capacity under construction July 1, 1954	80,100
Total expansion in place and under construction July 1, 1954	893,600
Total capacity of plants considered a part of the expansion program and not under construction July 1, 1954	253,700

Only a small part of the 253,700 tons, P₂O₅ equivalent, of capacity listed as not under construction July 1, 1954, is expected to be constructed under the expansion program. In other words, the expansion under the 1,300,000-ton goal is not expected to greatly exceed the 893,600 tons in place and under construction July 1, 1954.

Based on present trends in consumption, this expansion in production facilities plus those in operation in 1951 should be ample to satisfy the foreseeable domestic and export needs during the next few years. In other words the available supply, in the near future, will not be limited by inadequate production facilities.

Status of Potash Expansion:

The capacity of the domestic potash industry in 1951 was reported to be 1.4 million tons of K₂O equivalent. The production goal, as established by ODM, was 2 million tons K₂O by July 1, 1954. This represents an expansion of 600,000 tons over the January 1, 1951, production capacity.

Summary

	<u>Capacity</u> <u>T/K₂O/Yr.</u>
1951 Base production capacity	1,400,000
Expansion January 1, 1952 to June 30, 1953 (est.)	<u>600,000</u>
Approximate total capacity June 30, 1953	2,000,000

The production goal was met ahead of schedule without tax amortization assistance.

During 1953-54 the industry has installed additional improvements and the present capacity to produce in terms of potassium oxide (K₂O) is in excess of 2 million tons.

Prospecting during the last year has added considerably to the known deposits of potash ores.

Table 1. -- 1953-54 FERTILIZER NITROGEN SUPPLY
Trade Delivery Basis 1/

(In tons of 2,000 pounds nitrogen content)

Source	:Ammonium	: Ammonium	:	: Compound	:	: Ammonia	: Nitrogen	:	Total by Source
	: Nitrate	: Sulfate &	: Other	: Natural	: Ammoniating	: Ammonia	: for	: Solutions	
	: All	: Ammonium	: Solids	: Organics	: Solutions	: for	: Direct	: for	
	: Grades	: Sulfate	3/	4/	:AN-NH ₃ & UAL	:Ammoniation	:Application	: Direct	
		: Nitrate 2/			5/	6/		:Application 7/	
<u>U. S. Production</u>									
Synthetic ammonia	339,000	135,000	87,000	--	391,000	105,000	333,000	51,000	1,441,000
By-product ammonia	--	182,000	--	--	--	3,000	--	--	185,000
Natural organics	--	--	--	35,000	--	--	--	--	35,000
Total	339,000	317,000	87,000	35,000	391,000	108,000	333,000	51,000	1,661,000
<u>Exports</u>	1,000	19,000	21,000	1,000	19,000	1,000	--	--	62,000
<u>Net Domestic Production</u>	338,000	298,000	66,000	34,000	372,000	107,000	333,000	51,000	1,599,000
<u>Imports</u>	139,000	107,000	171,000	4,000	--	--	--	--	421,000
<u>Total Supply -</u> <u>U. S. & Possessions</u>	477,000	405,000	237,000	38,000	372,000	107,000	333,000	51,000	2,020,000

1/ Based upon special reports from primary producers of synthetic ammonia, importers and other sources; data for by-product compounds based upon Bureau of Mines' Monthly Coke Report. Correlation with Bureau of Census' Facts for Industry and Import and Export Tabulations in process and some adjustments may be made when all data are appraised; as a result of available tests, it is believed that data presented represent reasonably correct proximates (proximity estimates). To avoid disclosure of individual company operations certain designated materials have been combined.

2/ Includes estimated ammonium sulfate content of imported and exported mixed fertilizers.

3/ Includes estimated ammonium phosphates, sodium nitrate, urea mixtures, calcium nitrate and cyanamid.

4/ Estimated nitrogen content of natural organics used in commercial fertilizer.

5/ Includes estimated nitrogen content derived from solutions and ammonia in exported ammoniated superphosphates and mixed fertilizers.

6/ Includes small quantities of ammonia solutions and ammonia liquor.

7/ Includes compound nitrogen solutions, ammonium nitrate solutions and aqua ammonia used for this purpose.

September, 1954

Table 1A. -- ESTIMATED 1954-55 FERTILIZER NITROGEN SUPPLY

(In tons of 2,000 pounds nitrogen (N))

Source	:Ammonium : Ammonium :	: Compound :	: Ammonia :	Nitrogen :	Total
	: Nitrate : Sulfate & : Other :	: Natural : Ammoniating :	: Ammonia : for :	Solutions :	by
	: All : Ammonium : Solids :	: Organics :	: for : Direct :	for :	Source
	: Grades : Sulfate :	<u>2/</u> :	<u>3/</u> : :AN-NH ₃ & UAL	:Ammoniation:Application:	
	: Nitrate 1/:	:	<u>4/</u> :	<u>5/</u> :	:Application 6/:
<u>U. S. Production</u>					
Synthetic ammonia 7/	360,000	133,000	130,000	--	410,000
By-product ammonia	--	180,000	--	--	--
Natural organics	--	--	--	35,000	--
Total	360,000	313,000	130,000	35,000	410,000
				120,000	123,000
				395,000	395,000
				75,000	75,000
					1,623,000
					183,000
					35,000
					1,841,000
<u>Exports</u>	1,000	19,000	21,000	1,000	19,000
				1,000	1,000
				--	--
					62,000
<u>Net Domestic Production</u>	359,000	294,000	109,000	34,000	391,000
				122,000	122,000
				395,000	395,000
				75,000	75,000
<u>Imports</u>	139,000	107,000	171,000	4,000	--
				--	--
				--	--
					421,000
<u>Total Supply -</u>					
<u>U. S. & Possessions</u>	498,000	401,000	280,000	38,000	391,000
				122,000	122,000
				395,000	395,000
				75,000	75,000
					2,200,000

For the purpose of this tabulation, the following groupings have been made:

- 1/ Includes estimated ammonium sulfate content of imported and exported mixed fertilizers.
- 2/ Includes estimated ammonium phosphates, sodium nitrate, urea mixtures, calcium nitrate, cyanamid and nitraphosphates.
- 3/ Estimated nitrogen content of natural organics used in commercial fertilizer.
- 4/ Includes estimated nitrogen content derived from solutions and ammonia in exported ammoniated superphosphates and mixed fertilizers.
- 5/ Includes small quantities of ammonia solutions and ammonia liquor.
- 6/ Includes compound nitrogen solutions, ammonium nitrate solutions and aqua ammonia used for this purpose.
- 7/ U. S. production synthetic ammonia based on prospective production pattern rather than capacity of the industry to produce.

September, 1954

Table 2. -- PHOSPHATE: 1953-55 Supply for Fertilizer Purposes
United States and Possessions (Trade delivery basis)(In tons of 2,000 pounds available phosphoric oxide (P_2O_5))

Source	Normal superphosphate	Concentrated superphosphate	Other <u>1/</u>	Total by source
<u>U. S. Production</u>	1,663,000 <u>2/</u>	491,000	239,000	2,393,000
<u>Exports</u>	56,000	16,000	16,000 <u>3/</u>	88,000
Net supply, U. S. production	1,607,000	475,000	223,000	2,302,000
<u>Imports</u>	--	2,000	60,000	62,000
Total Supply - U. S. and Possessions	1,607,000	477,000	283,000	2,364,000

1/ Includes estimates for complex phosphatic materials.2/ Includes wet-base goods and enriched.3/ Includes P_2O_5 content of prepared phosphatic mixtures, ammonium phosphates and ammoniated superphosphates.

September, 1954

Table 2A. -- PHOSPHATE: Estimated 1954-55 supply for fertilizer purposes
United States and possessions

(In tons of 2,000 pounds available phosphoric oxide (P_2O_5))

Source	: : Normal : superphosphate	: Concentrated : superphosphate	: Other 1/ :	: Total by source
<u>U. S. Production 4/</u>	1,590,000 2/	526,000	260,000	2,376,000
<u>Exports</u>	56,000	16,000	16,000 3/	88,000
Net supply, U. S. production	1,534,000	510,000	244,000	2,288,000
<u>Imports</u>	--	2,000	60,000 3/	62,000
Total supply, U. S. and possessions	1,534,000	512,000	304,000	2,350,000

1/ Includes estimates for complex phosphatic materials.

2/ Includes wet-base goods and enriched.

3/ Includes P_2O_5 content of prepared phosphatic mixtures, ammonium phosphates and ammoniated superphosphates.

4/ U. S. production is based on consumption trends and prospective demand rather than capacity of the industry to produce.

September, 1954

Table 3. -- POTASH: 1953-54 Supply for Fertilizer Purposes
 United States and Possessions. (Trade delivery basis)
 (In tons of 2,000 pounds potassium oxide (K_2O) content)

Source	:Muriate of : potash : 60% and 50% grade:	:Sulfate of potash: & sulfate of potash magnesia	:Manure: : Salts:	: Misc. & by- product materials 1/:	Total by Source
Deliveries from U. S. production	1,629,000	100,000	1,000	34,000	1,764,000
Exports	44,000	6,000	--	4,000	54,000
Net Supply - U. S. production	1,585,000	94,000	1,000	30,000	1,710,000
Imports	90,000	25,000	--	6,000	121,000
Total Supply - U. S. and Possessions	1,675,000	119,000	1,000	36,000	1,831,000

1/ Includes potash content of oilseed meal and by-product residues used for fertilizer, potassium nitrate and calculated potash content of mixed fertilizers, exported and imported.

September, 1954

Table 3A. -- POTASH: Estimated 1954-55 Supply for Fertilizer Purposes
United States and Possessions

(In tons of 2,000 pounds potassium oxide (K_2O) content)

Source	:Muriate of : potash : 60% and 50% grade:	:Sulfate of potash: : & sulfate of : potash magnesia	: Misc. & by- : product : Salts:	: Manure: : materials 1/:	Total by Source
Deliveries from U. S. production	1,755,000	110,000	3,000	35,000	1,903,000
<u>Exports</u>	44,000	6,000	--	4,000	54,000
Net supply - U. S. production 2/	1,711,000	104,000	3,000	31,000	1,849,000
<u>Imports</u>	90,000	25,000	--	6,000	121,000
Total Supply - U. S. and Possessions	1,801,000	129,000	3,000	37,000	1,970,000

1/ Includes potash content of oilseed meal and by-product residues used for fertilizer, potassium nitrate and calculated potash content of mixed fertilizers, exported and imported.

2/ Net supply from U. S. production is based on prospective demand rather than capacity of the industry to deliver from domestic production. The above-ground supply may be in excess of the figures shown.

Table 4. -- Cash Receipts from Farm Marketings, Government Payments and Estimated Expenditures for Fertilizers, 1952-53 (1,000 dollars)

Regions	: : Crops : paym'ts: :	:Govern- ment: :	Total	:Livestock: : and : products: :	Grand Total	:Est. expend- itures for fertilizer :	% fert. exp. of total fertilizer :	% fert. exp. grand total crop: & Gov. receipts
New England	236,579	3,792	240,371	537,858	778,229	22,000	9.15	2.83
Middle Atlantic	735,890	14,184	750,074	1,872,758	2,622,832	101,000	13.47	3.85
South Atlantic	1,967,880	23,661	1,991,541	958,161	2,949,702	293,000	14.71	9.93
East North Central	1,967,587	33,036	2,000,623	3,992,243	5,992,866	247,000	12.35	4.12
West North Central	2,682,095	60,452	2,742,547	5,231,708	7,974,255	101,000	3.68	1.27
East South Central	1,198,165	23,891	1,222,056	842,122	2,064,178	157,000	12.85	7.61
West South Central	2,019,208	35,715	2,054,923	1,616,135	3,671,058	67,000	3.26	1.83
Mountain	1,042,421	25,681	1,068,102	1,229,243	2,297,345	22,000	2.06	.96
Pacific	<u>2,184,043</u>	<u>17,135</u>	<u>2,201,178</u>	<u>1,372,307</u>	<u>3,573,485</u>	<u>112,000</u>	<u>5.09</u>	<u>3.13</u>
U. S. TOTAL	14,033,868	237,547	14,271,415	17,652,535	31,923,950	1,122,000	7.86	3.51

Source: Based on agricultural marketing service data.

Table 5.--Relation of expenditures for fertilizers to total agricultural production expenses of farm operators and to farm income in the previous year, United States, 1911-1953

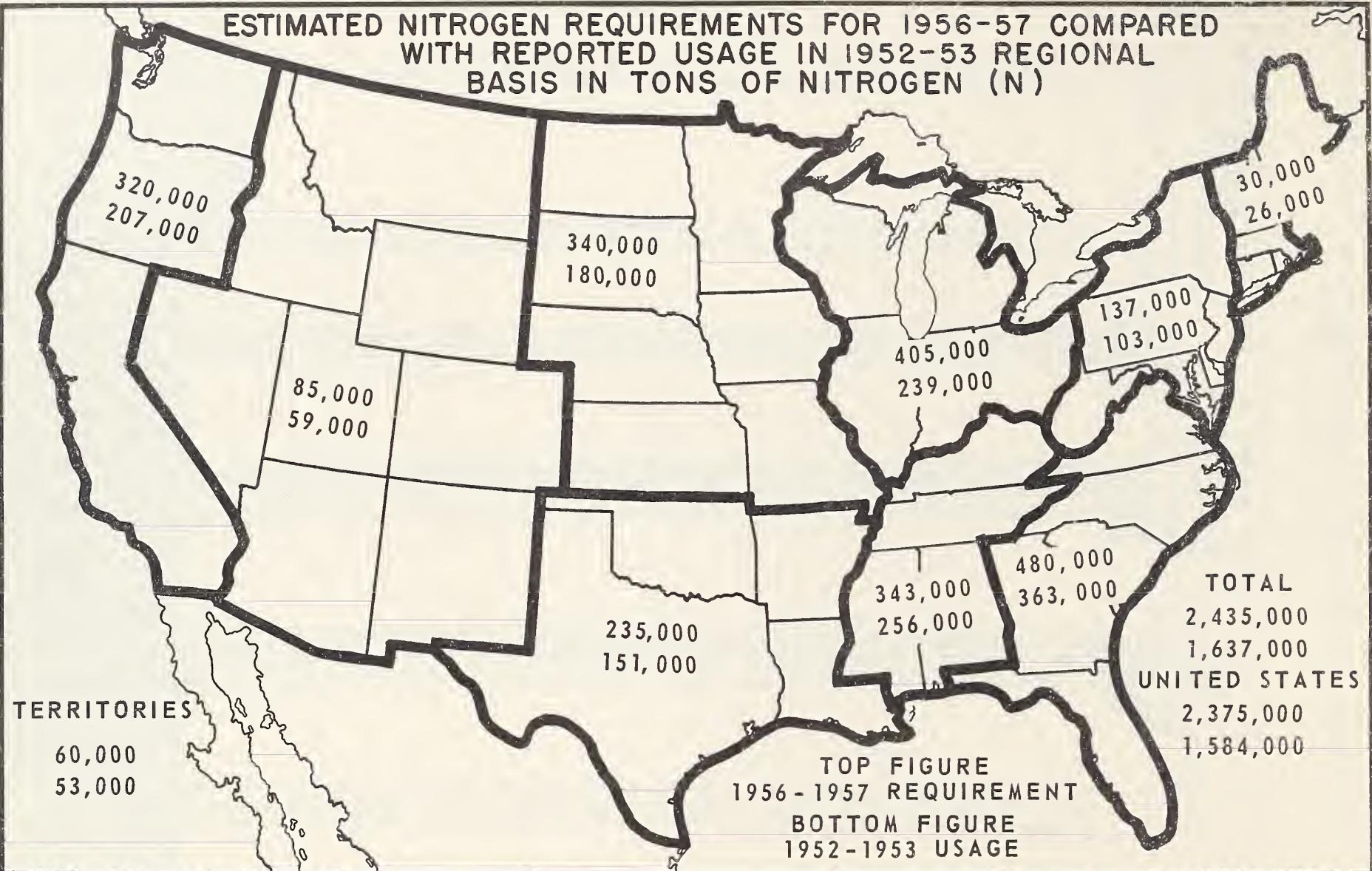
Calendar year	Cash income		Expenditures for fertilizers		
	Total production expenses 1/	from crops and payments 2/	Portion of Production: Previous year's income		
			Government	Amount	expenses
	Million dollars	Million dollars	Million dollars	Percent	Percent
1911	3,646	2,925	159	4.4	5.4
1912	3,890	3,111	153	3.9	5.2
1913	4,035	3,095	172	4.3	5.5
1914	4,120	2,920	197	4.8	6.4
1915	4,223	3,280	159	3.8	5.4
1916	4,845	4,043	165	3.4	5.0
1917	6,136	5,660	218	3.6	5.4
1918	7,558	6,985	297	3.9	5.2
1919	8,461	7,674	326	3.9	4.7
1920	9,130	6,654	359	3.9	4.7
1921	6,875	4,199	203	3.0	3.1
1922	6,826	4,321	193	2.8	4.6
1923	7,125	4,885	200	2.8	4.6
1924	7,495	5,415	210	2.8	4.3
1925	7,464	5,526	229	3.1	4.2
1926	7,505	4,889	227	3.0	4.1
1927	7,545	5,157	205	2.7	4.2
1928	7,855	5,044	267	3.4	5.2
1929	7,780	5,125	268	3.4	5.3
1930	7,059	3,840	264	3.7	5.2
1931	5,634	2,536	184	3.3	4.8
1932	4,574	1,997	113	2.5	4.5
1933	4,374	2,604	118	2.7	5.9
1934	4,727	3,450	141	3.0	5.4
1935	5,111	3,551	160	3.1	4.6
1936	5,581	3,938	160	2.9	4.5
1937	6,126	4,315	208	3.4	5.3
1938	5,744	3,672	182	3.2	4.2
1939	6,088	4,173	218	3.6	5.9
1940	6,484	4,237	223	3.4	5.3
1941	7,469	5,302	250	3.3	5.9
1942	9,465	7,028	301	3.2	5.7
1943	10,882	8,652	373	3.4	5.3
1944	11,640	9,842	400	3.4	4.6
1945	12,629	10,307	440	3.5	4.5
1946	14,238	11,937	521	3.7	5.1
1947	16,849	13,910	581	3.4	4.9
1948	18,545	13,725	655	3.5	4.7
1949	18,038	12,922	698	3.9	5.1
1950	20,024	12,858	744	3.7	5.8
1951	22,000	13,473	951	4.3	7.4
1952	23,027	14,294	1,052	4.6	7.8
1953 3/	22,218	14,010	1,110	5.0	7.8

1/ Includes livestock industry.

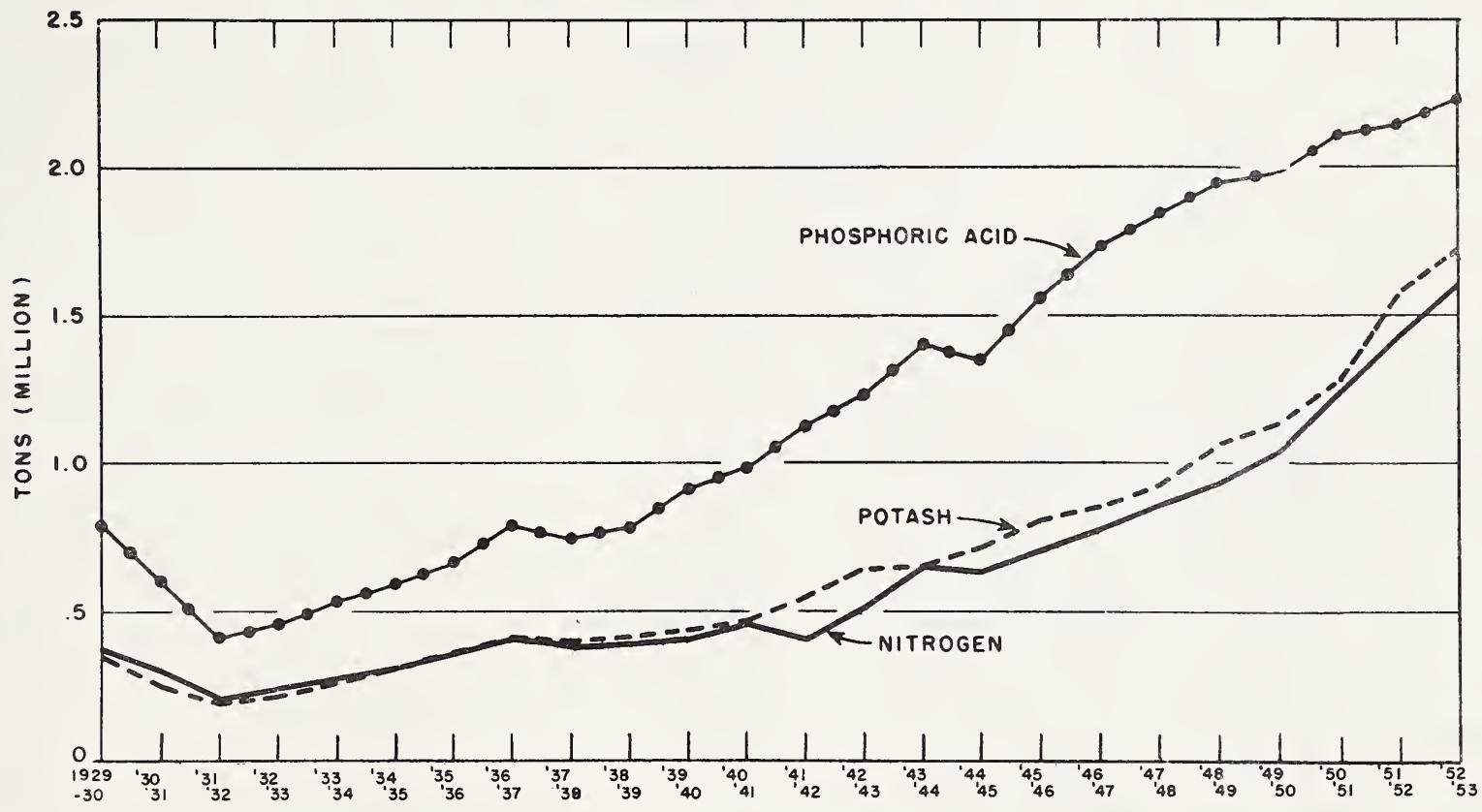
2/ Excludes livestock industry.

3/ Preliminary.

ESTIMATED NITROGEN REQUIREMENTS FOR 1956-57 COMPARED
WITH REPORTED USAGE IN 1952-53 REGIONAL
BASIS IN TONS OF NITROGEN (N)



U. S. CONSUMPTION OF PLANT FOODS*



* PLANT FOODS CONTAINED IN COMMERCIAL FERTILIZER
ADAPTED FROM DATA COMPILED BY SOIL AND WATER
CONSERVATION RESEARCH BRANCH.

